Contribution ID: **227** Type: **Poster Presentation**

Effect of Electrode Composition on the Partial Discharge Characteristics of a Dielectric Elastomer Actuator System

Wednesday 6 July 2016 14:40 (20 minutes)

Dielectric Elastomer Actuators (DEAs) are electroactive polymers capable of achieving high actuation. The key to achieving these high actuation strains is to make both the electrodes and the elastomer highly compliant without sacrificing their dielectric strength or conductivity. DEAs, because they are soft materials designed to exert mechanical stress, often break down because of mechanical phenomena less common in other, rigid, high voltage systems. This work explores the use of partial discharge activity as a precursor to breakdown for DEAs. A variety of electrodes have been used, powdered electrodes and conductive greases are of particular interest because they provide negligible increases to the stiffness of the actuator, allowing greater strains. An increase in coronal discharge is seen from the use of less rigid electrodes, resulting in a trade-off between mechanical performance and electrical aging. Additionally, it has been found that the electrode's properties, such as thermal conductivity, electrical conductivity, and active area affect the electrical performance of the DEA. This paper presents a comparison of partial discharge characteristics based on electrode composition.

Author: MARTINEZ, Andrea (University at Buffalo, The State University of New York)

Co-authors: Dr ZIRNHELD, Jennifer (University at Buffalo); Dr BURKE, Kevin (University at Buffalo)

Presenter: MARTINEZ, Andrea (University at Buffalo, The State University of New York)

Session Classification: Poster 1-C

Track Classification: Dielectrics, Insulation, and Breakdown